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## Description

Method and device for displaying navigational information for a  
5 vehicle

The invention relates to a method and a device in which navigational  
information for a vehicle is superimposed on an image of the vehicle  
environment, this graphic representation of a navigational  
10 representation being transformed by means of a perspective  
transformation.

Such a method or such a device is known from European patent  
application EP 0 406 946 A1.

15 In addition, there are navigation systems today which display to the  
driver the recommended route at a junction by means of pictograms  
and emit acoustic information, e.g. "Take the second turning on the  
right" or "Drive straight on at the roundabout". Some systems also  
20 additionally show the recommended route on a map.

From the Patent Abstracts of Japan with regard to Japanese patent  
application JP 09113301 a navigational apparatus is known in which a  
virtual vehicle is displayed on the windshield of a vehicle in such  
25 a way that at a first distance from a junction on a route to the  
destination a directional indicator is placed on the virtual vehicle  
and when a second closer distance from the junction is reached the  
virtual vehicle is steered in the appropriate direction.

30 Furthermore, from US patent application US 2002/0055808 A1 a display  
system for a vehicle is known in which a virtual vehicle proceeding  
in front is projected onto the windshield, travel conditions of the  
virtual vehicle being determined on the basis of road conditions and  
travel conditions for the real vehicle.

35 Finally, from US patent documentation US 6,411,896 B1 a method and a  
system are known for displaying warning notifications for vehicle

drivers in which information is extracted from a geographical database and displayed.

5 A vehicle is deemed below to refer not just to land vehicles but also to watercraft and airplanes.

10 The object of the invention is to indicate a method and a device for displaying navigational information for a vehicle such that the route through road traffic to a defined destination is displayed to a vehicle driver in an intuitive and easily comprehensible manner.

According to the invention, this object is achieved with regard to the method in the features of Claim 1 and with regard to the arrangement in the features of Claim 5.

## Claims

1. Method for displaying navigational information for a vehicle, wherein the navigational information for a vehicle is displayed in the form of a virtual pilot vehicle superimposed on an image of the vehicle environment and wherein a position, an orientation and a size of the displayed virtual pilot vehicle are determined by a current speed of the vehicle, reference points for a recommended route, a position and orientation of the vehicle, a position and orientation of a camera for recording the vehicle environment and an eye position and a line of sight of the driver, and wherein a route or action recommendation to "keep minimum distance from the vehicle ahead in accordance with the current driving speed" is displayed by means of a virtual pilot vehicle being positioned on the image of the road such that it appears to be proceeding in front of the driver at precisely the minimum distance currently required, while driving too close to the vehicle in front is shown by a real vehicle being located in the image between the driver and the virtual vehicle.
2. Method according to Claim 1, wherein a pilot position (L) and a pilot orientation (O) are determined according to reference points (R) for a recommended route and according to the current position (P) and speed of the vehicle.
3. Method according to Claim 1 or Claim 2, wherein a model of the pilot vehicle in three-dimensional space is created according to the pilot position and pilot orientation and wherein a two-dimensional representation which is superimposed on the image of the vehicle environment perceived by the driver is computed from this model.
4. Method according to any one of the preceding Claims, wherein further information is additionally displayed via text or pictogram on a panel on the virtual pilot vehicle.
5. Device for displaying navigational information for a vehicle,

wherein an apparatus for superimposing navigational information for a vehicle in the form of a virtual pilot vehicle on an image of the vehicle environment exists such that a position, an orientation and  
5 a size of the virtual pilot vehicle are determined in accordance with a current speed of the vehicle, reference points for a recommended route, a position of the vehicle, an orientation of the vehicle, a position of the camera for recording the vehicle environment and an orientation of the camera for recording the  
10 vehicle environment and wherein a route or action recommendation to "keep minimum distance from the vehicle ahead in accordance with the current driving speed" is displayable by means of a virtual pilot vehicle being positioned on the image of the road such that it appears to be proceeding in front of the driver at precisely the  
15 minimum distance currently required, while driving too close to the vehicle in front is shown by a real vehicle being located in the image between the driver and the virtual vehicle.